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EXAMINER	
VATHYAM, SUREKHA	
ART UNIT	PAPER NUMBER
1753	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/757,666	KAO ET AL.	
	Examiner	Art Unit	
	Surekha Vathyam	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31, 33-47* is/are rejected.

7)☒ Claim(s) *32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07/22/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The disclosure is objected to because of the following informalities:

Page 10, paragraph [063], last line, after "1 to 10 inches" insert - -, respectively- -.

Page 14, paragraph [082], last line, change "sections 365" to - -sections 375- -.

Appropriate correction is required.

Drawings

3. Figures 1A and 1B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "1020" has been used to designate both "channel support" in Fig. 13 and undefined parts in Fig. 15 and Fig. 18.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "122" in fig. 1B, "1004", "1006" and "1020" in fig. 18 and "1001" in fig. 19. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application.

6. The drawings are objected to because "1020" in Fig. 15 should be changed to "1120" to be consistent with the description in the specification (page 18, paragraph [0104], lines 3 – 4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the

drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

7. Claim 32 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 35, 36 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Each of claims 35, 36 and 40 recite limitations with reference to figures in the specification, specifically, figs. 6, 7 and 15, respectively. It is unclear what, if any, aspect of the figures is required (see MPEP 2173.05 (s)).

10. Claims 2 – 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention. Line 2 of claim 2 recites the limitation "said end section". Given the plurality of adjacent input channels recited in independent claim 1, it is unclear which one of the plurality of input channels the "said end section" refers to.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1 – 7, 9 – 20 and 38 – 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Buican et al. (US 5,100,627).

Regarding claim 1, Buican ('627) discloses a microfabricated (see Table A) device (see fig. 2) comprising: a detection chamber (comprising 76, 77 and 78); a plurality of adjacent input channels (60, 61, 62) fluidly connected to said detection chamber (see fig. 3), each of said plurality of input channels fluidly connected to said detection chamber via an enlarged end section (see fig. 3 and column 2, lines 15 – 21); and at least one output channel (60, 61, 62) fluidly connected to said detection chamber (see fig. 3).

Regarding claim 2, Buican ('627) discloses the device wherein said end section varies in width as function of distance from the detection chamber, said end section being widest at said detection chamber (see fig. 3 and column 2, lines 15 – 21).

Regarding claim 3, Buican ('627) discloses the device wherein said end section has a gradual taper (see fig. 3).

Regarding claim 4, Buican ('627) discloses the device wherein said taper is linear (see 76 and 78).

Regarding claim 5, Buican ('627) discloses the device wherein said taper is parabolic (see 77).

Regarding claim 6, Buican ('627) discloses the device wherein adjacent input channels are separated by a tapered junction (see fig. 3).

Regarding claim 7, Buican ('627) discloses the device wherein said detection chamber further comprises a plurality of adjacent channel supports (see fig. 3), said channel supports positioned opposite of said tapered junctions and useful in minimizing sample diffusion (column 3, lines 4 – 7) when electrical fields are applied to said device to electrokinetically move sample materials.

Regarding claim 9, Buican ('627) discloses the device further comprising a number of output channels equal to said input channels and said output channels being positioned opposite of said input channels (see figs. 2 and 3).

Regarding claim 10, Buican ('627) discloses the device wherein said output channels are configured as mirror images of said input channels (see fig. 3).

Regarding claim 11, Buican ('627) discloses the device wherein said plurality of adjacent sample streams remain discrete for at least a threshold distance through the detection chamber, said threshold distance being between 10 to 2000 um (see Table A and column 4, lines 12 – 24).

Regarding claim 12, Buican ('627) discloses a microfabricated (see Table A) manifold (see fig. 2) comprising: a detection chamber (comprising 76, 77 and 78); a plurality of adjacent channel inlets (60, 61, 62) fluidly connected to said detection chamber (see fig. 3); and a plurality of tapered ends wherein adjacent channel inlets are separated by a tapered end (see fig. 3).

Regarding claim 13, Buican ('627) discloses the microfabricated manifold wherein each channel inlet comprises a first end section and a second wider end section downstream of said first end section (see fig. 3).

Regarding claim 14, Buican ('627) discloses the microfabricated manifold wherein each channel inlet is taper-shaped (see fig. 3).

Regarding claim 15, Buican ('627) discloses the microfabricated manifold wherein said taper is linear (see 76 and 78).

Regarding claim 16, Buican ('627) discloses the microfabricated manifold wherein said taper is parabolic (see 77).

Regarding claim 17, Buican ('627) discloses the microfabricated manifold further comprising at least one y-shaped outlet (see fig. 3).

Regarding claim 18, Buican ('627) discloses the microfabricated manifold further comprising a channel outlet positioned opposite each of said channel inlets (see fig. 3).

Regarding claim 19, Buican ('627) discloses the microfabricated manifold wherein said detection chamber further comprises a plurality of channel supports (see fig. 3), said channel supports positioned opposite of said tapered ends such that a sample stream exiting said channel inlet flows between two channels supports and does not diffuse in the lateral direction (column 3, lines 4 – 7).

Regarding claim 20, Buican ('627) discloses a method for multiplexed detection of samples in a microfluidic device (column 3, lines 1 – 3), said method comprising the steps of: introducing a sample into at least two of said plurality of input channels of the device of any one of claims 1-11 (column 4, lines 9 – 11); applying electrical fields to said device such that said samples flow as discrete sample streams from said plurality of input channels into said detection chamber (column 4, lines 33 – 46); and detecting a property of said sample streams while said sample streams flow through said detection chamber (see fig. 1 and column 3, lines 21 – 43).

Regarding claim 38, Buican ('627) discloses the device wherein the tapered junction terminates at a point (see fig. 3).

Regarding claim 39, Buican ('627) discloses the device wherein the tapered junction has a blunt tip (see fig. 3).

13. Claims 1 – 6, 11 – 16, 20 – 25, 30 – 31 and 33 – 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Nordman et al. (US 6,596,140).

Regarding claim 1, Nordman ('140) discloses a microfabricated (column 9, lines 18 – 19) device (12) for electrokinetically moving samples (column 11, lines 35 – 39) comprising: a detection chamber (30) for receiving a plurality of adjacent sample streams to be detected (see figs. 2, 2a and 4); a plurality of adjacent input channels (18) fluidly connected to said detection chamber (see fig. 1), each of said plurality of input channels fluidly connected to said detection chamber via an enlarged end section (see fig. 2 and column 13, lines 56 – 62); and at least one output channel (31, 50) fluidly connected to said detection chamber.

Regarding claim 2, Nordman ('140) discloses the device wherein said end section varies in width as function of distance from the detection chamber, said end section being widest at said detection chamber (see fig. 2 and column 13, lines 56 – 62).

Regarding claim 3, Nordman ('140) discloses the device wherein said end section has a gradual taper (see fig. 2).

Regarding claim 4, Nordman ('140) discloses the device wherein said taper is linear (see fig. 2).

Regarding claim 5, Nordman ('140) discloses the device wherein said taper is parabolic (see fig. 2a).

Regarding claim 6, Nordman ('140) discloses the device wherein adjacent input channels are separated by a tapered junction (see figs. 2, 2a and 4).

Regarding claim 11, Nordman ('140) discloses the device wherein said plurality of adjacent sample streams remain discrete for at least a threshold distance through the detection chamber, said threshold distance being between 10 to 2000 um (see fig. 4 and column 16, lines 14 – 49).

Regarding claim 12, Nordman ('140) discloses a microfabricated (column 9, lines 18 – 19) manifold (12) for use in electrokinetic applications (column 11, lines 35 – 39) comprising: a detection chamber (30); a plurality of adjacent channel inlets (18) fluidly connected to said detection chamber (see fig. 1); and a plurality of tapered ends wherein adjacent channel inlets are separated by a tapered end (see fig. 2, 2a and 4).

Regarding claim 13, Nordman ('140) discloses the microfabricated manifold wherein each channel inlet comprises a first end section and a second wider end section downstream of said first end section (see fig. 2 and column 13, lines 56 – 62).

Regarding claim 14, Nordman ('140) discloses the microfabricated manifold wherein each channel inlet is taper-shaped (see fig. 2).

Regarding claim 15, Nordman ('140) discloses the microfabricated manifold wherein said taper is linear (see fig. 2).

Regarding claim 16, Nordman ('140) discloses the microfabricated manifold wherein said taper is parabolic (see fig. 2a).

Regarding claim 20, Nordman ('140) discloses a method for multiplexed detection of samples in a microfluidic device (column 5, lines 60 – 62), said method

comprising the steps of: introducing a sample into at least two of said plurality of input channels of the device of any one of claims 1-11 (column 6, lines 11 – 16); applying electrical fields to said device such that said samples flow as discrete sample streams from said plurality of input channels into said detection chamber (column 6, lines 16 – 24); and detecting a property of said sample streams while said sample streams flow through said detection chamber (column 6, lines 25 – 33).

Regarding claim 21, Nordman ('140) discloses a method for multiplexed detection of samples in a microfluidic device (column 5, lines 60 – 62), said method comprising the steps of: electrokinetically flowing at least two sample streams into a detection chamber (30) (column 6, lines 11 – 16 and column 11, lines 35 – 39), said at least two sample streams defining a device plane (see fig. 1); directing a light beam (48) through said detection chamber such that said light beam perpendicularly intersects said at least two sample streams and propagates in said device plane (column 11, line 62 – column 12, line 9); and detecting an optical property of said at least two sample streams as said streams flow through said detection chamber (column 13, lines 16 – 25).

Regarding claim 22, Nordman ('140) discloses the method wherein said device further comprises tapered junctions extending into said detection chamber (see figs. 2, 2a and 4) and useful in preventing said sample streams from laterally dispersing (column 13, lines 42 – 55).

Regarding claim 23, Nordman ('140) discloses the method wherein said sample streams remain straight as said sample streams flow through said detection chamber (column 13, lines 42 – 55).

Regarding claim 24, Nordman ('140) discloses the method further comprising electrokinetically flowing (column 11, lines 35 – 39) ancillary flows around said sample streams such that lateral dispersion is prevented (column 17, lines 57 – 59).

Regarding claim 25, Nordman ('140) discloses the method wherein said light beam is a laser (column 11, lines 59 – 62).

Regarding claim 30, Nordman ('140) discloses the method wherein the light beam is directed from a light source in the plane of the device (see fig. 1 and column 11, line 62 – column 12, line 6).

Regarding claim 31, Nordman ('140) discloses a microfluidic system (see fig. 1) for carrying out various chemical and biochemical processes (column 2, lines 39 – 44), said system comprising: a microfabricated (column 9, lines 18 – 19) device (12) having a detection chamber (30) and a plurality of input channels (18), said input channels and detection chamber defining a plane of the device (see fig. 1); a controller (42) adapted to provide electric fields (column 13, lines 29 – 31) such that when samples are present in said input channels, said samples can be electrokinetically manipulated through said input channels and into said detection chamber by application of said electric fields (column 6, lines 11 – 16 and column 11, lines 35 – 39); a light source (34) adapted to direct a light beam (48) across said detection chamber and in the plane of the device,

said beam perpendicularly intersecting said samples when said samples flow through said detection chamber (column 11, line 62 – column 12, line 9); and at least one detector (38) for measuring optical properties of said samples in said detection chamber wherein sample streams introduced into said detection chamber are detected simultaneously (column 13, lines 16 – 25).

Regarding claim 33, Nordman ('140) discloses the system further comprising ancillary flow channels interposed between said input channels such that confining streams from said ancillary flow channels confine sample streams entering the detection chamber such that lateral diffusion is minimized (column 17, lines 57 – 59).

Regarding claim 34, Nordman ('140) discloses the system wherein said input channels are separation channels and contain a medium useful in electrophoretic separations (column 11, lines 31 – 35 and column 9, lines 24 – 38).

Regarding claim 35, Nordman ('140) discloses the system wherein at least one of said input channels is shaped as an input channel of FIG. 6 (see Fig. 2).

Regarding claim 36, Nordman ('140) discloses the system wherein at least one of said input channels is shaped as an input channel of FIG. 7 (see Fig. 2).

Regarding claim 37, Nordman ('140) discloses the system wherein said sample streams curve as said sample streams flow through said detection chamber (column 13, lines 42 – 55 and column 14, lines 38 – 44).

Regarding claim 38, Nordman ('140) discloses the system wherein the tapered junction terminates at a point (see fig. 2).

Regarding claim 39, Nordman ('140) discloses the system wherein the tapered junction has a blunt tip (see fig. 2a).

Regarding claim 40, Nordman ('140) discloses a microfabricated device for electrokinetically moving samples comprising a detection chamber as shown in FIG. 15 (see fig 2, 2a and 4).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buican et al. (US 5,100,627).

Buican ('627) discloses the device as discussed with regards to claim 3 above. Regarding claim 8, Buican ('627) discloses the device having y-shaped output channels positioned opposite of said plurality of input channels (see fig. 3). Buican ('627) discloses plurality of channels (58 – 62) some of which are capable of being input channels while others are capable of being output channels (column 4, lines 9 – 24). Therefore, it would be obvious to one of ordinary skill in the art to have only one y-shaped output channel in the device of Buican ('627).

18. Claims 7 – 10, 17 – 19 and 26 – 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nordman et al. (US 6,596,140) in view of Buican et al. (US 5,100,627).

Nordman ('140) discloses the device as discussed with regards to claim 6 above and the microfabricated manifold as discussed with regards to claim 12 above. Regarding claims 7 and 19, Nordman ('140) does not disclose channel supports opposite of said tapered junctions.

Buican ('627) teaches a device wherein a detection chamber further comprises a further comprises a plurality of adjacent channel supports, said channel supports positioned opposite of said tapered junctions (see fig. 3).

It would have been obvious to one of ordinary skill in the art to modify the device and/or the microfabricated manifold of Nordman ('140) to include the channel supports as taught by Buican ('627) because the supports help control the flow of liquid as explained by Buican ('627) (column 4, lines 19 – 24).

Nordman ('140) discloses the device as discussed with regards to claim 3 above and the microfabricated manifold as discussed with regards to claim 12 above. Regarding claims 8 and 17, Nordman ('140) does not explicitly disclose having a y-shaped output channel opposite of said plurality of input channels.

Buican ('627) teaches a device having a y-shaped output channel opposite of said plurality of input channels (see fig. 3).

It would have been obvious to one of ordinary skill in the art to modify the device and/or the microfabricated manifold of Nordman ('140) to include a y-shaped output channel as taught by Buican ('627) because as Buican ('627) explains the enlarged portion of the channel is effective in containing the flow of particles and controlling their distribution (column 2, lines 12 – 26).

Regarding claims 9 and 18, Buican ('627) teaches a device further comprising a number of output channels equal to said input channels and said output channels being positioned opposite of said input channels (see figs. 2 and 3).

Regarding claim 10, Buican ('627) teaches a device wherein said output channels are configured as mirror images of said input channels (see fig. 3).

Nordman ('140) discloses the method as discussed with regards to claim 21 above. Regarding claim 26, Nordman ('140) does not explicitly disclose the method wherein said device further comprises a reflector.

Buican ('627) teaches a device comprising a reflector (18, 20).

It would have been obvious to one of ordinary skill in the art to modify the method of Nordman ('140) to include the reflector as taught by Buican ('627) because it helps direct the laser beam through the chamber as explained by Buican ('627) (column 3, lines 23 – 27).

Regarding claim 27, Buican ('627) teaches the angle of the reflector is approximately 45 degrees as seen in Fig. 1.

Regarding claim 28, Nordman ('140) discloses the light source is not normal to the device (see column 12, lines 1 – 6)

Regarding claim 29, Nordman ('140) discloses the light beam is directed from a light source not in the plane of the device (see column 11 line 57 – column 12, line 1).

19. Claims 41 – 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nordman et al. (US 6,596,140) in view of Carrillo (US 6,731,437).

Nordman ('140) discloses the microfluidic system of claim 31 as discussed above. Regarding claims 41 and 42, Nordman ('140) discloses the microfluidic system wherein said detection chamber includes a sidewall (28b).

Nordman ('140) does not expressly disclose the sidewall having a draft angle less than 90 degrees.

Carrillo ('437) teaches a microfluidic system (see fig. 2A) wherein a detection chamber includes a sidewall having a draft angle of approximately 70 degrees (see fig. 4A).

It would have been obvious to one of ordinary skill in the art to modify the microfluidic system of Nordman ('140) to have a draft angle of less than 90 degrees as taught by Carrillo ('437) because it facilitates component removal from a mold, i.e., injection molded optics as explained by Carrillo ('437) (column 8, lines 38 – 46).

Nordman ('140) discloses the method of claim 21 as discussed above. Regarding claims 43 and 44, Nordman ('140) discloses the method wherein said detection chamber includes a sidewall (28b).

Nordman ('140) does not expressly disclose the sidewall having a draft angle less than 90 degrees.

Carrillo ('437) teaches a method wherein a detection chamber includes a sidewall having a draft angle of approximately 70 degrees (see fig. 4A).

It would have been obvious to one of ordinary skill in the art to modify the method of Nordman ('140) to have a draft angle of less than 90 degrees as taught by Carrillo

('437) because it facilitates component removal from a mold, i.e., injection molded optics as explained by Carrillo ('437) (column 8, lines 38 – 46).

Regarding claims 45 – 47, both Nordman ('140) (at column 12, lines 1 – 9) and Carrillo ('437) (see fig. 4A) further teach the entry angle being non-zero. Though numerical values are not explicitly disclosed, Nordman ('140) recognizes this angle as a parameter for optimization (column 12, lines 1 – 12).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kambara (US 5,277,780) discloses a detection chamber with a light source comprising a reflector.

Regnier et al. (US 6,156,273) discloses electrokinetically moving samples through plurality of input channels with enlarged end section with gradual taper.

Nakanishi et al. (US 6,454,925) discloses detection chamber with light source having a range of entry angles.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Surekha Vathyam whose telephone number is 571-272-2682. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SV
March 29, 2007

NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700